Public Safety Wireless Network

RADIO SPECTRUM POLICY AND LEGISLATIVE ISSUES REPORT

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FOREWORD

This report is presented by the Public Safety Wireless Network (PSWN) program. It is intended as a primer to assist those interested in becoming more familiar with the various aspects of the needs and missions of the public safety community.

The document is further intended to assist people working in public safety organizations to better understand the regulatory and legislative processes affecting and directing the management of radio spectrum usage. The report also strives to describe the administrative processes and relevant committees and groups affiliated with the key organizations involved; the U.S. Congress, the Federal Communications Commission (FCC), and the National Telecommunications Information Administration (NTIA). The Federal Law Enforcement Wireless Users Group (FLEWUG) and the PSWN Program Management Office (PMO) together embody the Federal (and eventually the State and local) vision of the future of public safety wireless communications. The long-range goals of these organizations include a national plan for seamless, ubiquitous communications for all public safety agencies.

To make comments regarding the information contained in this document, or to obtain further information regarding the purpose and goals of the PSWN program, please contact the PSWN Program Management Office (PMO) at 800-565-PSWN. Those interested in becoming involved in the PSWN program may contact Tyrel W. Hayton, Department of Justice, and Raymond A. Barnett, Department of the Treasury, Co-Chairs of the Federal Law Enforcement Wireless Users Group (FLEWUG), who may be contacted by calling the above phone number.

EXECUTIVE SUMMARY

This report focuses on the organizations with jurisdiction and regulating authority for the current management and future direction of radio spectrum use. The three primary organizations are the U.S. Congress, the Federal Communications Commission (FCC), and the Department of Commerce's National Telecommunications and Information Administration (NTIA). As important parts of the Federal Government, these organizations initiate and ensure compliance with the rules pertaining to spectrum, the coordinated allocation of frequency to approved users, and the effective designation of spectrum block usage for specific purposes.

The U.S. Congress debates and ultimately passes laws that direct the activities of the NTIA and the FCC. The U.S. Congress is the primary policy maker in dictating the goals and objectives for radio spectrum use. The federal public safety community is directly affected by the NTIA, which has authority for spectrum use by Federal government users. The FCC has authority over all state and local government as well as private commercial spectrum users. The two organizations work together to prevent overlapping use and to coordinate the needs and demands of the federal and non-federal user types.

The authority of these organizations affects the ability of the public safety community to fulfill its mandate to protect life, health, and property. As heavy users of wireless radio communications, members of the public safety community require reliable interference-free systems. Due to increased competition for spectrum access and the growth in new uses for the limited spectrum, members of the public safety community need to leverage their position in civil society to compete effectively for necessary spectrum. Understanding the prevailing authorities, their relevant organizational structure, and the processes involved in obtaining spectrum is crucial to effectively engaging the system to advantage and success.

Greater awareness of the processes involved on the part of the entire public safety community will create a cooperative constituency working with and within the system. Radio communications are an integral part of ensuring fast, efficient, and coordinated interaction between the diverse members of the public safety community. Historically distinct roles and responsibilities of public safety personnel have blurred and become more integrated and interactive. Emergency equipment is more complex and expensive, organizational systems are more sophisticated, and the needs of the public safety community have advanced with the development of new technologies. These factors make effective communications a critical resource for seamless coordination and interaction among all response teams in an emergency.

This document intends to promote a dialogue between public safety community members and spectrum authorities. Only a dynamic dialogue between these parties will allow for a true understanding of the relative merits of competing users' interests. Education is critical to maintaining the appropriate resources for the vital service the public safety community provides.

T A B L E O F C O N T E N T S

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1. INTRODUCTION

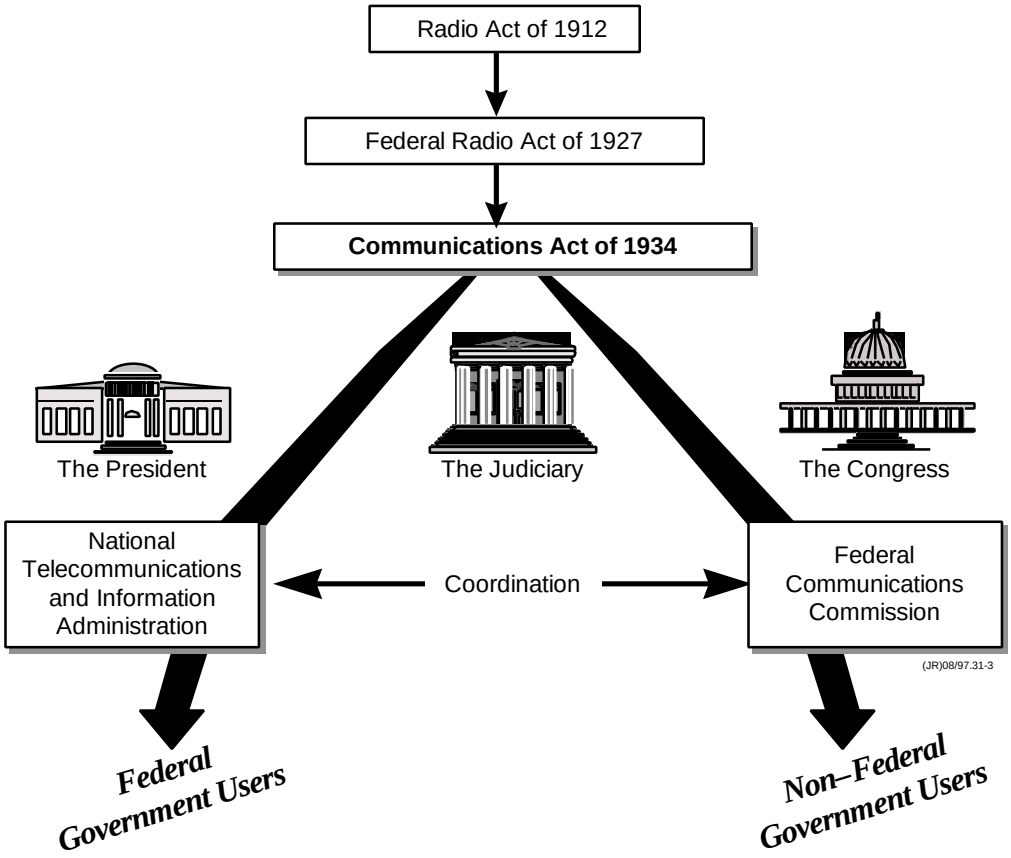


Figure 1-1 National Spectrum Management
Source: NTIA, http://www.ntia.doc.gov/osmhome

The Radio Spectrum Policy and Legislative Issues Report is intended to provide local, state, and federal public safety agencies with an understanding of the political processes involved in spectrum allocation, regulation, and management. Included in this report is information on —

- how the Federal Government manages radio spectrum and creates spectrum policy
- Congress's role in spectrum policy making
- the roles and structures of the federal spectrum regulators, namely the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA)
- the decision making processes and informational tools that the FCC and NTIA employ to manage spectrum

- joint efforts by the FCC and NTIA to coordinate spectrum management.

The U.S. Government — in response to the call for regulation stemming from widespread radio interference caused by unchecked transmission — first addressed radio spectrum management through congressional passage of the Radio Act of 1912. The 1912 act that required transmitters be registered with the Department of Commerce, but did not provide for the control of their frequencies, operating times, and station output powers. Thus, in 1922, eight federal agencies banded together under the Secretary of Commerce to coordinate their use of spectrum, forming a committee called the Interdepartment Radio Advisory Committee (IRAC).

The earliest commercial use of spectrum began with the broadcast of Pittsburgh station KDKA on November 2, 1920. When a vibrant market for radio spectrum emerged, the courts began applying common-law standards in creating a system of property rights for radio spectrum. However, in April 1926, the courts ruled in *United States v. Zenith Radio Corp.* that the Secretary of Commerce had no legal basis for restricting licenses.

For this reason, Congress passed the Federal Radio Act of 1927. The Federal Radio Act of 1927 gave the U.S. Government the needed authority to coordinate use of radio spectrum. The act declared that radio spectrum was a public resource and created the Federal Radio Commission, which was charged with the ability to regulate spectrum by assigning licenses. The Federal Radio Act of 1927 also introduced the public interest standard. The public interest standard, a concept that has endured to the present day, requires that spectrum licenses be assigned on the basis of "public interest, convenience, or necessity."

The Federal Communications Act of 1934 created the Federal Communications Commission and empowered the President, or the President's designated manager, with the task of managing the Federal government's spectrum use. The President designated the Commerce Department's Office of Telecommunications (OT) to work in conjunction with the IRAC and the White House's Office of Telecommunications Policy (OTP) to manage Federal Government use of the radio spectrum.

In 1978, the President established the National Telecommunications and Information Administration (NTIA) by Executive Order and gave it full responsibility to manage Federal government use of spectrum by allocating and assigning licenses to Federal users.

Today, the FCC and NTIA allocate and assign frequencies to specific user communities within their respective jurisdictions. Spectrum allocation refers to the fact that spectrum is organized into groups, or blocks, of contiguous frequencies for particular radio services with somewhat uniform technical standards. Frequency assignment refers to granting licenses, in the case of the

President, Congress, and the FCC have stated that the communications policies they formulate are intended to foster competition in the marketplace. In 1993, Congress ordered the FCC to auction the radio spectrum on the premise that those who are able to pay for the spectrum will also be the ones who will be able to effectively compete and provide the benefits of competition to the consumer. In 1996, Congress passed the Telecommunications Act of 1996. This act was passed with the intention of removing regulatory hurdles impeding competition and to pave the way for the birth of new telecommunications technologies.

At the same time, the public safety community has experienced an increasing demand for additional radio spectrum and enhanced systems interoperability. The ability of multi-jurisdictional public safety agencies to communicate in emergency situations is vital to public safety. The availability of new technologies for communicating by voice, video, and data has spurred this intense demand for bandwidth. Government entities which manage and regulate spectrum are called to swiftly address these demands and enact regulations which will enhance the ability of public safety agencies to communicate with one another seamlessly and effectively.

2. CONGRESS'S ROLE IN SPECTRUM MANAGEMENT

The U.S. Congress is one of the chief influences on radio spectrum policy formulation and implementation. Congress exercises its influence through the deliberations of certain congressional committees with jurisdiction and subsequent floor debate on relevant proposed legislation.

As noted above, Congress created the FCC through the Communications Act of 1934, which was the first comprehensive attempt to regulate the communications industry. Laws passed by Congress dealing with non-federal and commercial spectrum users are implemented by the FCC. Changes to the operations and management of the NTIA, which implements laws passed for federal spectrum users, can also be effected through congressional action. The FCC and NTIA interpret and implement laws that Congress formulates to manage spectrum and regulate the telecommunications industry.

2.1 U.S. Senate

3. FEDERAL COMMUNICATIONS COMMISSION

In the United States, radio spectrum is regulated by two distinct bodies: the FCC and the NTIA. The FCC is an independent regulatory agency established through the Communications Act of 1934 to regulate interstate and international communications by radio, television, wire, satellite, and cable.

The FCC develops and implements policy in response to direction from Congress. Its mission is to encourage competition in communications markets while protecting the public interest. To meet these ends, the FCC conducts technical and economic analyses to assess the short and long term effects of the policies it makes and provides guidance on regulatory compliance and private sector problem resolutions. The FCC maintains liaisons with other agencies, foreign governments, and international committees to monitor international standards and frequency compliance.

3.1 Core Responsibilities

The FCC regulates spectrum by developing and enforcing rules mandated by legislation and by regulating use of the radio spectrum. The FCC manages the spectrum use for communications industry by—

- establishing and administering rules for radio spectrum auctions
- allocating spectrum for commercial and public safety users
- assigning frequencies and granting licenses commercial radio spectrum use
- assigning frequencies and granting licenses public safety entities for use of radio spectrum through frequency coordinators
- issuing rules and regulations for spectrum use
- ensuring compliance to FCC rules and regulations
- consulting with other government agencies such at the Federal Trade Commission (FTC), Justice Department, the Securities and Exchange Commission (SEC), the Department of State, and the National Telecommunications and Information Administration (NTIA) to ensure that policies related to the communications industry are consistent.

3.2 Organizational Structure

The FCC is comprised of five Commissioners, all of whom are appointed by the President and confirmed by the Senate. The Commissioners hold regular open agenda meetings,

and, by law, the Commission must hold one open meeting per month. The President designates one Commissioner as Chairman, who coordinates the work of the FCC and represents the agency in legislative matters with other regulatory agencies.

The FCC is organized by subject matter into bureaus and offices. Most items considered by the Commission are developed in one of the following divisions:

- **Cable Services Bureau** — regulates cable television
- **Common Carrier Bureau** — regulates domestic wireline telephony
- **Compliance and Information Bureau** — investigates violations and answers questions
- **International Bureau** — regulates international and satellite communications
- **Mass Media Bureau** — regulates radio and television broadcasts
- **Office of Engineering and Technology** — monitors scientific and technological developments and coordinates allocation and assignment of frequencies shared by the private sector and federal agencies
- **Office of Plans and Policy** — develops and analyzes policy proposals
- **Wireless Telecommunications Bureau (WTB)** — regulates all FCC domestic wireless services except those involving satellite communications or broadcasting. Examples include cellular telephone, personal communications service (PCS), private radio, and pagers.

The WTB's Private Wireless and Public Safety Division (PW&PS) oversees licensing for public safety wireless communications as well as industrial, transportation, and other private radio services; aviation, marine, and amateur radio; Interactive Voice and Data (IVDS); broadcast auxiliary service; personal radio services; point-to-point microwave services; and antenna tower clearance.

3.2.1 Non-Federal Public Safety Spectrum Regulation and Management

Non-federal public safety frequency coordination is managed by the WTB's **PW&PS Division**. Frequency is assigned to public safety agencies by designated frequency coordinators. The following organizations are involved in frequency coordination:

- **Emergency Medical Radio Service** — International Municipal Signal Association (IMSA)
- **Fire Radio Service** — IMSA

- **Forestry-Conservation Radio Service** — Forestry Conservation Communications Association (FCCA)

- **Highway Maintenance Radio Service** — American Association of State Highway and Transportation Officials (AASHTO)

- **Local Government Radio Service** — Association of Public Safety Communications Officials (APCO)

- **Police Radio Service** — APCO

- **Special Emergency Radio Service** — Personal Communications Industry Association (PCIA)/IMSA/International Association of Fire Chiefs (IAFC).

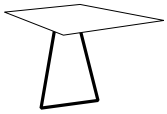
When a public safety agency applies for new spectrum, the agency must first contact one of the relevant frequency coordinators, who will assign a block of available spectrum in the geographic area where the requesting agency is located. The frequency coordinator takes the request of the public safety agency into consideration by using the following information:

- desired frequency band (VHF, UHF, 800 MHz)
- desired number of channels
- transmit and receive frequencies
- transmitting antenna gain
- azimuth of the main power lobe of transmitting antenna
- angle of downward tilt of the antenna's main power lobe
- transmit and receive squelch tones.

The frequency coordinators balance the agency's request with the goal of minimizing harmful interference from new or existing systems and providing useable channels for all licensees. Upon the designation of a frequency, the public safety agency must submit an application to the PW&PS Division for a license to operate on the specified frequency. FCC application fees can be waived with the submission of a letter of non-profit determination from the Internal Revenue Service (IRS). Frequency coordinators, however, charge fees to all public safety agencies.

Beginning on October 17, 1997, the radio service coordination will be consolidated pursuant to the February 1997 Second Report & Order (R&O), part of what the FCC calls the refarming proceeding. Refarming has been an effort to develop an overall strategy for using spectrum in the private land mobile radio (PLMR) allocations more efficiently. Refarming rules are only applicable to the PLMR frequencies below 512 MHz. This R&O consolidated all the private land mobile radio services into two pools — Public Safety and Industrial/Business. Applicants may use the service of any frequency coordinator certified in the pool in which they are eligible. Each of the current public safety frequency coordinators and the special emergency frequency coordinator is certified in the public safety pool.

The Private Wireless and Public Safety Division is also responsible for coordinating the regional planning process associated with the 800 Megahertz (MHz) channels made available in the 1980s by the FCC for state and local public safety use. The PW&PS Division maintains the regional plans, approves amendments, and adjudicates disputes between regions. This function stems from the process established by the National Public Safety Planning Advisory Committee, which operated in the mid-1980s as an FCC-sponsored entity.



Public safety agency contacts frequency coordinator to request more spectrum

issues a Notice of Proposed Rulemaking (NPRM) or a Memorandum Opinion and Order (MO&O).

- **Notice of Proposed Rulemaking (NPRM)** — details proposed change(s) in FCC rules and requests comments. NPRMs are assigned a docket number. After reviewing comments, the FCC issues a "Further NPRM" or a Report & Order (R&O). An NPRM can be issued without first issuing an NOI.

- **Report and Order (R&O**) **and Memorandum Opinion and Order (MO&O)** — official statement of FCC action. An R&O and MO&O will either amend FCC rules or make the decision not to do so.

- **Petition for Reconsideration** — if someone feels the issues were not clarified or resolved, the Petition for Reconsideration must be filed within 30 days of the date the R&O appears in the *Federal Register*.

- **Order on Reconsideration** — final FCC decision. Appeals on Orders on Reconsideration can be taken to a Federal Court of Appeals.

The Petition for Reconsideration and Final Order on Reconsideration are the actions and processes followed after the final report is issued and a party of the ruling wants to appeal the FCC's decision. If the party wishes to appeal the FCC's Final Order on Reconsideration, the party can appeal the rule in a Federal Court of Appeals.

The FCC rulemaking process is illustrated in Figure 3-2. For further information on the FCC processes, refer to the FCC Internet World Wide Web page at http://www.fcc.gov or refer to Section 1.401 of the FCC rules.

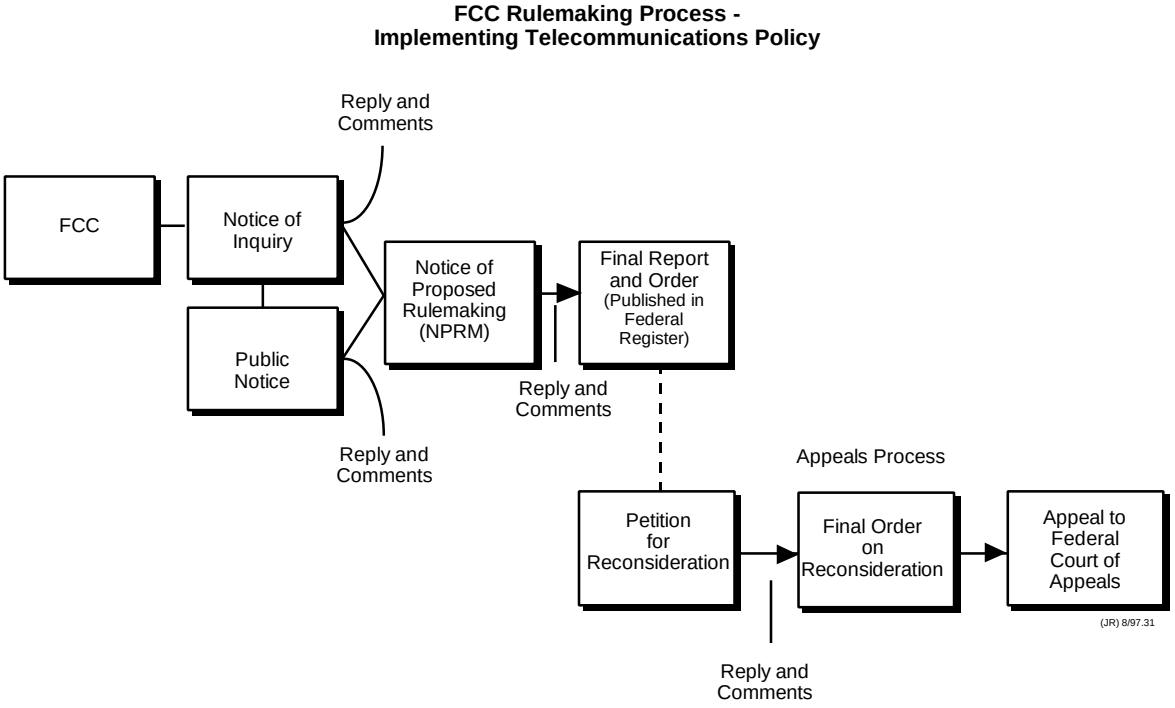


Figure 3-2 The FCC Rulemaking Process

3.3.1 Submitting Comments in Response to FCC Actions

The FCC solicits feedback from the public through the comment process. Any person or representative of an organization may file comments with the FCC. Comments may be in the form of a short statement or letter, or they may be detailed documents prepared by an attorney. However, comments do not need to be prepared by an attorney. Comments should reference the docket number or the rulemaking number.

There are two types of comments: formal and informal comments. When four copies of comments are submitted to the FCC, they become formal comments and are distributed to the FCC staff for review. If one copy is submitted, the comments are considered informal, which means they will not be as widely distributed within the FCC.

3.3.2 Presentations to the FCC

Some presentations are made to the FCC outside the public comment process. These presentations are called *ex parte*. In some instances, these are written presentations made in a manner unavailable to all commenting parties. In other instances, they are oral presentations. The FCC process ensures that these presentations are included in the public record.

The presenter of comments must submit copies of the presentation to the Commission to be entered into the public record. A person who makes a written presentation must submit two copies of the presentation to the Commission's Secretary under separate cover for inclusion in the public record. In an oral presentation, a memorandum containing a summary of the substance of

any new data or arguments not reflected in that person's written comments must be submitted to the Commission for inclusion in the public record. Both of these submissions must occur no later than the next business day after the presentation.

The rules apply to anyone attempting to influence the outcome of an FCC proceeding, whether or not that person is a party to the proceeding. However, for members of Congress or their staffs and any branch or agency of the Federal Government and their staffs, presentations are subject to these rules only if the presentations are of significance and clearly intended to affect the ultimate decision. In this case, a written summary of any oral presentations are prepared and placed along with any written presentations in the public record.

3.4 Radio Spectrum Auctions

In the Omnibus Budget Act of 1993, Congress instructed the FCC to use competitive bidding procedures to assign frequencies and award radio spectrum licenses within the allocated range for a particular radio service. Previously, the FCC awarded licenses using a lottery system. The end result of the lottery system was a backlog of applications, slowing the growth of the communications marketplace.

The FCC has used both the traditional outcry method and a simultaneous multiple-round auction process to auction certain frequencies for commercial use. From the FCC's vantage point, the main benefits of the auction process are—

- The ability to get licenses in the hands of companies that are willing and able to provide service to American consumers in an efficient and expeditious manner.

- The money raised by the auctions.

The auctions have raised more than $23 billion in net revenue for the U.S. Government, and the FCC predicts it will raise another $20 billion from spectrum auctions in the coming years.

Table 1, located in Appendix B of this document, describes the various services which have been auctioned for use in a given range on the radio spectrum. The services to be provided, their frequency range, the number of licenses won, and total revenue generated from the auctions are listed in the table. Table 2, located in Appendix C of this document, lists frequencies and services to be auctioned in 1998.

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V ? ? AT Establishes policies concerning spectrum allocation among federal users

V ? ? AT Provides the various departments and agencies with guidance to ensure that their conduct of telecommunications activities is consistent with these policies.

The NTIA's mandate includes setting policies for efficiently and effectively managing the federal use of the radio spectrum. The agency also acts as the analyst and proposal maker for administration positions on telecommunications legislation and regulations. In this role, it comments to the FCC on behalf of executive branch agencies on specific communication issues. The NTIA works to coordinate federal government policies regarding spectrum use.

Part of the NTIA's mandate is to participate in evaluating the capability of telecommunication resources, in recommending remedial actions, and in developing policy options. Some of these actions include—

V ? ? AT Coordinating federal telecommunications assistance to State and local governments

V ? ? AT Conducting studies to identify and provide assistance to remove barriers to telecommunications applications

V ? ? AT Conducting needs assessments to aid in the design of telecommunications services

V ? ? AT Providing experimental and pilot tests of telecommunications applications to fulfill national goals.

4.2 The NTIA Organization

The NTIA's responsibilities are divided among five offices and three staff groups. Of the five offices, the following affect public safety: the Office of Policy Analysis and Development (OPAD), the Institute for Telecommunications Sciences (ITS), the Office of Telecommunications Applications (OTA), the Office of International Affairs (OIA), and the Office of Spectrum Management (OSM).

4.2.1 Important Spectrum Offices

The **Office of Policy Analysis and Development** is responsible for NTIA's domestic and federal communications policy development. OPAD develops policy recommendations regarding the introduction of competition and deregulation in the telecommunications industry. The office prepares wide-ranging studies of the U.S. telecommunications industry and the policies that affect it. In close coordination with NTIA's Office of Chief Counsel, OPAD also prepares comments for telecommunications policy proceedings conducted by the FCC.

The **Institute for Telecommunications Sciences (ITS)** is NTIA's chief engineering and research arm. ITS is a centralized federal laboratory that addresses a range of technical issues associated with telecommunications. ITS addresses both spectrum related and wireline issues.

The **Office of Telecommunications Applications (OTA)** assists in the development of educational and public telecommunications services through the Public Telecommunications Facilities Program. This program provides grants for the improvement of public radio and television facilities.

The **Office of International Affairs (OIA)** provides policy analyses and technical guidance, and represents the U.S. in international telecommunications forums. OIA together with the Office of Spectrum Management, has a leadership role in preparing for the many conferences and meetings of the International Telecommunication Union.

The **Office of Spectrum Management (OSM)** develops and implements policies and procedures associated with spectrum usage and frequency assignment to the stations operated by the Federal Government in the United States. OSM develops long-range plans and policies for—

V ? ? AT Spectrum management

V ? ? AT Review of federal radio-communication systems to ensure that sufficient spectrum is available for their compatible operation

V ? ? AT Analysis and resolution of interference problems involving federal radio-communication systems

V ? ? AT Analysis of spectrum use in selected bands using state-of-the-art analytic and measurement techniques.

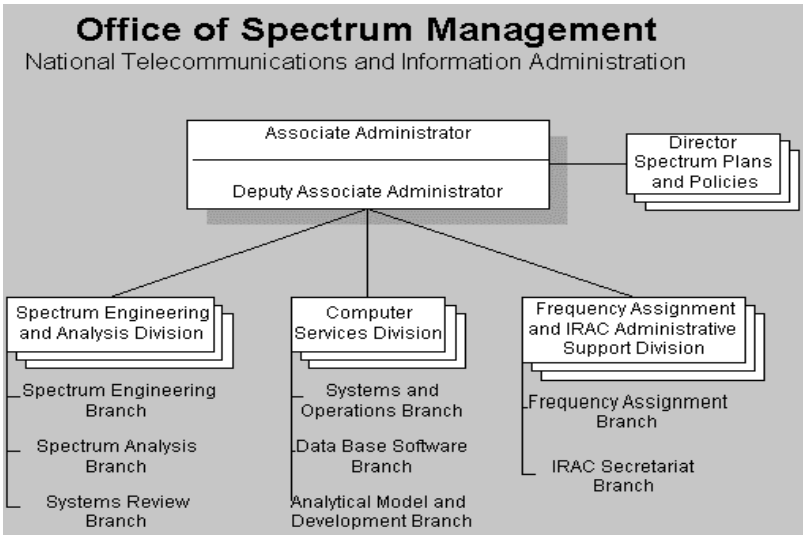

Figure 4-1 Structure of the NTIA's Office of Spectrum Management

Source: NTIA, http://www.ntia.doc.gov/osmhome

4.2.2 NTIA Divisions and Other Organizations

Several divisions and organizations within the NTIA are pertinent to frequency management and public safety radio communications.

The Interdepartment Radio Advisory Committee (IRAC)

The Interdepartment Radio Advisory Committee (IRAC) is an interagency committee of federal radio frequency managers that advises the executive branch on the Federal Government's use of spectrum. The IRAC was established by Federal Government radio spectrum users in 1922 as the first organization to assist the Secretary of Commerce address the growing national concern about radio interference. The original IRAC consisted of representatives from only 8 federal agencies; today over 20 federal agencies are represented.

The agencies represented in the IRAC include: the U.S. Postal Service, the Commerce Department, the Veterans Department, the U.S. Information Agency, the Federal Emergency Management Agency, the General Services Administration, the Department of State, the Department of Energy, the U.S. Army, the Department of Agriculture, the U.S. Navy, the FCC liaison, the Health and Human Services Department, the Federal Aviation Administration, the U.S. Coast Guard, the U.S. Air Force, the Treasury Department, the Justice Department, the Interior Department, NASA, and the National Science Foundation.

The IRAC serves as the forum for resolving radio frequency transmission interference issues involving the Federal Government agencies. The committee also develops and executes policies, programs, procedures, and technical criteria pertaining to the allocation, management, and use of the spectrum. The IRAC is chaired by the NTIA.

The IRAC and the FCC interact via a representative appointed by the FCC to serve as liaison between the two groups.

Subcommittees of the IRAC include—

V	? ? AT	Frequency Assignment Subcommittee (FAS)
V	? ? AT	Radio Conference Subcommittee (RCS)
V	? ? AT	Spectrum Planning Subcommittee (SPS)
V	? ? AT	Technical Subcommittee (TSC)
V	? ? AT	International Notification Group (ING)

Secretariat.

OSM Divisions

(These divisions are portrayed in Figure 4-1, page 4-3.)

The **OSM Frequency Assignment and IRAC Administrative Support Division (FA&IASD)** of the NTIA provides administrative and executive secretariat support to the IRAC. This support includes processing frequency authorization requests from the federal government agencies with the assistance of the IRAC's Frequency Assignment Subcommittee and recommending approval to the OSM Deputy Associate Administrator. This division carries out the following tasks:

V ? ? AT Issues and updates the *NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management*

V ? ? AT Reviews, processes, and coordinates frequency assignment actions

V ? ? AT Provides specialized retrievals from the Government Master File of Frequency Assignments (GMF) and related database files, and maintains GMF and related database files

V ? ? AT Provides administrative support to the IRAC, its subcommittees, and ad hoc groups

V ? ? AT Performs field surveys to ensure that the spectrum is used as authorized.

The **OSM Computer Services Division** supports the spectrum management process of the OSM through the maintenance and use of the GMF of frequency assignments and related information.

The **OSM Spectrum Engineering and Analysis Division** is tasked with providing technical engineering support to NTIA for the effective and efficient analysis of conditions related to national and international spectrum issues.

4.3 NTIA Procedures for the Assignment of Frequencies

Government agencies seeking frequency assignments decide individually whether they need a frequency assignment, what frequency they need, and how many agency program requirements can be fulfilled by using telecommunications systems that utilize this radio frequency. Each agency makes all necessary technical feasibility studies, coordinates with other agencies involved, and prepares and files an application with the NTIA's OSM FA&IASD for consideration by the FAS of the IRAC.

In instances where the public sector's spectrum use may affect government operations, the FCC's FAS representative submits the frequency request in question to the FAS. The FCC, as a

government entity, also submits frequency requests to the FAS for FCC spectrum requirements relating to assignments for shared government/non-governmental use.

The agendas for proposed frequency assignments created by the FAS are then submitted to each FAS agency for review and to ensure compatibility with current frequency assignments. The OSM and FA&IASD review the applications for accuracy, completeness, and compliance with applicable regulations and procedures. They also evaluate applications to determine the potential for technical interference with existing assignments.

If there is disagreement or a specific request is made by an agency, the application may be referred to the IRAC for resolution of the dispute. Unresolvable issues, those directed by the NTIA, or those requested by another agency are referred to the Deputy Associate Administrator of OSM. The OSM Deputy Administrator either resolves the issues or refers them to the NTIA Administrator for resolution. Frequency assignment decisions made by the NTIA Administrator may be appealed to the Office of Management and Budget.

4.3.1 Frequency Assignment Review Program

Government agencies using spectrum are required to maintain a review program of their radio station frequency assignments. They are subsequently required to delete or amend frequency assignments when appropriate. This maintenance program requirement ensures that the Government Master File's (GMF) listing of frequency is correct and that the frequencies are in use. The GMF is maintained by NTIA. Agencies must continue to justify that the frequencies they hold are required for continued operations for the purpose stated in their original justification. They must also prove that they are still qualified for authorization under the provisions contained in the *Manual of Regulations and Procedures for Federal Radio Frequency Management* produced by NTIA.

NTIA also monitors compliance through the administration of a spectrum management program. This program uses a van-mounted Radio Spectrum Measurement System (RSMS). The RSMS determines whether radio installations operated by the Federal Government are using authorized frequencies and are operating in accordance with applicable regulations. The program provides information to help determine whether additional uses can be made in a particular band at a particular location and provides information to prevent or resolve cases of interference between two or more users. NTIA's responsibilities also include determining appropriate spectrum sharing and resolving and identifying problems with shared spectrum. These NTIA duties and subsequent requirements imposed on the frequency holder help to make the most efficient use of the spectrum resources used by the government.

5. NTIA AND FCC COORDINATION ON PUBLIC SAFETY MATTERS

The NTIA and FCC manage their particular constituents' use of spectrum. However, both must keep in mind the overall general interest since 93.1% of the spectrum below 30 GHz is shared, with only 5.5% allocated exclusively to the private sector, and 1.4% allocated exclusively to the government. Thus, the NTIA and FCC cooperatively develop a comprehensive long-range plan for improved management of all electromagnetic spectrum resources. These activities include joint determination of the National Table of Frequency Allocations. At the direction of Congress, the degree of coordination on this front has increased in recent years. In addition to the IRAC (see Section 4.2.2), other forums exist for these two agencies to work together and to ensure an appropriate degree of coordination between the two primary federal agencies involved in spectrum management. These groups include——

V ? ? AT The Public Safety Wireless Advisory Committee (PSWAC)

V ? ? AT The National Public Safety Telecommunications Council (NPSTC)

V ? ? AT The Public Safety Communications Joint Working Group

V ? ? AT The NTIA Public Safety Program Office.

5.1 The Public Safety Wireless Advisory Committee

In 1995, Congress ordered the FCC and NTIA to establish the Public Safety Wireless Advisory Committee (PSWAC) to provide advice and recommendations on specific wireless communication requirements of public safety agencies through the year 2010. Membership was composed of federal, state, and local public safety agencies; equipment manufacturers; and commercial and wireless service providers. The PSWAC issued its final report in September 1996. The report concluded that additional public safety spectrum is needed, that spectrum must be used more efficiently, and that interoperability standards must be established to meet the current and future needs of the public safety community. Specific conclusions of the report include—

V ? ? AT 2.5 MHz of spectrum should be identified immediately for interoperability from new or existing allocations.

V ? ? AT 25 MHz of spectrum should be allocated in the short term for public safety purposes. By the year 2010, as much as an additional 70 MHz may be needed to support the increased use of data, imagery, and video.

V ? ? AT PSWAC advocates the use of unused spectrum in the 746–806 MHz band (UHF TV channels 60–69), as well as TV channels below 512 MHz.

V ? ? AT

On August 13, 1996, NTIA's Spectrum Management Division announced the formation of a new Public Safety Program Office. This program was created to coordinate the various spectrum and telecommunications related activities and programs within the Federal Government as it relates to public safety. The Public Safety Program Office plays an integral role in the planning and development of public safety communications through participation in NPSTC, PSWN, and standards setting for equipment.

APPENDIX A

ABBREVIATIONS AND ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
APCO	Association of Public-Safety Communications Officials International, Inc.
CCP	Common Carrier Paging
DARS	Digital Audio Radio Service
DBS	Direct Broadcast Satellite
DoC	Department of Commerce
FA&IASD	Frequency Assignment and IRAC Administrative Support Division
FAS	Frequency Assignment Subcommittee
FCC	Federal Communications Commission
FLEWUG	Federal Law Enforcement Wireless Users Group
GHz	Gigahertz
GMF	Government Master File
ING	International Notification Group
IRAC	Interdepartment Radio Advisory Committee
ITS	Institute for Telecommunications Sciences
ITU	International Telecommunication Union
IVDS	Interactive Video & Data Service
kHz	kilohertz
LMDS	Local Multipoint Distribution Service
LMR	Land Mobile Radio
MHz	Megahertz
MDS	Multipoint Distribution Service
MO&O	Memorandum Opinion and Order
NOI	Notice of Inquiry
NPR	National Performance Review
NPRM	Notice of Proposed Rulemaking
NPSPAC	National Public Safety Advisory Committee
NPSTC	National Public Safety Telecommunications Council
NTIA	National Telecommunications and Information Administration
OET	Office of Engineering and Technology
OIA	Office of International Affairs
OMB	Office of Management and Budget
OPAD	Office of Policy Analysis and Development
OSM	Office of Spectrum Management
OTA	Office of Telecommunications Applications
PCIA	Personal Communications Industry Association
PCP	Private Carrier Paging
PCS	Personal Communications Systems
PLMR	Private Land Mobile Radio
PMO	Program Management Office
PSWAC	Public Safety Wireless Advisory Committee

PSWN	Public Safety Wireless Network
PW&PS	Private Wireless and Public Safety Division
R&O	Report & Order
RSMS	Radio Spectrum Measurement System
SMR	Specialized Mobile Radio
SPS	Spectrum Planning Subcommittee
TSC	Technical Subcommittee
UHF	Ultra High Frequency
VHF	Very High Frequency
WCS	Wireless Communications Service
WTB	Wireless Telecommunications Bureau

APPENDIX B

Service Auctioned	Frequency Range (MHz)	# of Licenses	# of Winning Bidders	Total $ Amount Raised (in Millions)
Wireless Communication Service (WCS) WCS continued	2305–2310, 2310–2315, 2315–2320, 2345–2360, 2350–2355, 2355–2360	126	17	14
Satellite Digital Audio Radio Service (DARS)	2320–2332.5, 2332.5–2345	2	2	173
CURRENT TOTALS:		**4273**	**610**	**$23 Billion**

APPENDIX C

FUTURE FCC SPECTRUM AUCTIONS

The FCC continues to announce auctions for new and existing communications services. The proposed auction schedule for the remainder of 1997 and early 1998 is —

V ? ? AT 800 MHz Specialized Mobile Radio Service (800 MHz SMR) — October 28, 1997

V ? ? AT Local Multipoint Distribution Service (LMDS) — February 18, 1998 — 27.50-28.35, 29.10-29.25, and 31-31.30 GHz

The following chart reflects the services and their allocated frequency ranges to be auctioned in 1998 pending FCC rulemaking action.

TABLE 2 ¾ 1998 AUCTIONS

SERVICE	FREQUENCY RANGE
Public Coast Stations	2-26, 156–162, and 217–220 MHz
Private Land Mobile Radio (PLMR)	220 MHz band
Lower 200 Channels – Specialized Mobile Radio (SMR)	806–809.750, 851–854.750 MHz
Common Carrier Paging (CCP)	929 MHz band
Private Carrier Paging (PCP)	951 MHz band
Lower Band Paging	55–56, 43–44, 152–159, 454–460 MHz
General Wireless Communications Services	4660–4685 MHz
Multiple Address Systems	928–929, 952-952.5, 941–941.5, 952–952.85, 956.25–956.45, 959.85–960 MHz
Narrowband PCS	901–902, 950–951, 940–941 MHz
Location Monitoring Services	904–909.750, 927.750–928, 919.750–921.750, 927.500–927.750, 921.750–927.250, 927.250–927.500 MHz

APPENDIX D

GLOSSARY OF TERMS

Communications Act of 1934 — An Act of Congress that established the Federal Communications Commission (FCC) to regulate the communications industry.

***Ex parte* Comments** — Comments submitted to the FCC outside the public comment process. *Ex parte* is a Latin term meaning "outside the process."

Federal Communications Commission (FCC) — The government agency that regulates commercial and non-federal public safety use of the radio spectrum.

Federal Radio Act of 1912 — Act of Congress that required all radio transmitters be registered of with the Department of Commerce.

Federal Radio Act of 1927 — Act of Congress that declared radio spectrum a public resource. Also created the Federal Radio Commission, which is the precursor organization to the FCC.

Frequency Allocation — Spectrum is organized into blocks or channels of contiguous frequencies for radio services. Blocks and channels are designated, or "allocated," to specific services.

Frequency Assignment —Granting licenses or authorizations which give an individual user or organization the right to use specific frequencies. The FCC assigns frequencies through issuing licenses; the NTIA assigns frequencies through issuing authorizations.

Frequency Coordinator — An independent organization designated by the FCC to coordinate spectrum use and recommend available frequency ranges in a given geographic area for public safety users.

National Telecommunications and Information Administration (NTIA) — The government agency that regulates federal government use of the radio spectrum.

Public Safety Communications Interoperability — The ability for different public safety agencies to communicate with each other. Vertical interoperability allows federal, state, and local public safety agencies to communicate, horizontal interoperability allows different public safety agencies in the same geographic jurisdiction to communicate.

Radio Frequency — A point on the radio spectrum.

Radio Frequency Interference[1] — The disruption of the radio signal reception caused by any source that generates waves at the frequency and along the same path as the desired wave.

[1] Harry Newton, *Newton's Telecom Dictionary - 11th edition.* New York, NY: Flartiron Publishing, Inc: 1996.

Radio Spectrum[2] — That group of electromagnetic energy whose wavelengths are between the audio and light range. Electromagnetic waves are usually transmitted between 500 KHz and 300 GHz.

The Telecommunications Act of 1996 — An Act of Congress to foster competition in the telecommunications marketplace. Significantly, the act cleared the way for cable and telephone companies to enter into each other's markets. It allowed the entry of public utility companies into telecommunications markets and allowed local telephone companies entry into the long distance market, upon meeting certain requirements, and preserved traditional local zoning authority over construction of wireless facility sitings. The Act also made other regulatory changes.

[2] ibid